Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

West Tennessee: its Resources and Advantages. By J. B. Killebrew. 8vo, pp. 93, 1880. From the author.

On the Physical Structure and Hypsometry of the Catskill Mountain region. By Arnold Guyot. (From Amer. Jour. Sci., Vol. XIX, June, 1880.) 8vo, pp. 22, maps 2. From the author.

Geological and Natural History Survey of North Carolina. Part III—Botany. By M. A. Curtis. 8vo, pp. 156, 1867.

The Felsites and their Associated Rocks north of Boston. (From Proc. Boston Soc. Nat. Hist., Vol. XX, Jan. 21, 1880.) By J. S. Diller. 8vo, pp. 12, 1880. From the author.

Proceedings of the Academy of Natural Sciences of Philadelphia. 8vo, pp. 152, 10 pls. Pt. I, 1880. From the academy.

Catalogue of North American Musci. Arranged by Eugene A. Rau and A. B. Hervey. 8vo, pp. 52, 1880. From the authors.

Korte Bidrag til nordisk Ichthyographi. III Gronlands og Islands Lycoder. Med Bemærkninger om andre nordiske Arter. (Aftryk af Vidensk. Meddel. fra den naturhist. Foren. i Kbhvn. 1879-1880.) By Dr. Chr. Lütken. 8vo, pp. 26, 1880. From the author.

Le Globe Lenox de 1511, Traduit de l'anglais par Gabriel Gravier. 8vo, pp. 26, 1880. From the author.

Découverte d'un Squelette entier de Rytiodus dans le Falun Aquitanien. (Ext. des Actes de la Société Linnéenne de Bordeaux.) Par M. E. Delfortrie. 4to, pp. 16, pls. 4, 1880. From the author.

The Orthonectida, a new class of the Phylum of the Worms. (From Quart. Journ. Micros. Sci.) By Alfred Giard. 8vo, pp. 15, pl. 1, 1880. From the author.

Zur Anatomie und Physiologie des Nervensystems der Nemertinen. Von A. A. W. Hubrecht. 4to, pp. 47, pls. 4, 1880. From the author.

——:o:——

GENERAL NOTES.

BOTANY.

CHANGES IN PLANT LIFE ON THE SAN FRANCISCO PENINSULA.[1]—We are not very apt to notice changes that gradually and progressively prepare themselves in our surroundings. We have no room in our journals for facts of every-day occurrence, and at the same time these gradual changes offer more analogies to the great secular changes that have preceded the present state of our globe, and give more material for the study of evolutions than all floods, earthquakes and other cataclysms.

All vegetation of our earth is subject to secular changes, and it is not necessary to go to the fossil plants, imbedded in coal, to find ample proofs for this axiom. The bogs of Northern Europe, the lacustrine dwellings of the Alpine regions, show in different strata the remainders of different forest trees; and in the Atlantic States many acute observers have noticed that the birch gradually supersedes the conifers.

Such a process of change, of course, is accelerated if to the secular process of change is added the powerful agent of human activity. I have had the good fortune to witness this process in two different quarters of the globe; in Australia and in California.

---

[1] The following essay, which will be of interest to all botanists and observers of plant growth generally, was read at the meeting of the Academy of Sciences, Feb. 2d, by Dr. Herman Behr, of San Francisco, and appeared in the *Rural Press*.

The neighborhood of San Francisco and its flora in the year 1850 was not entirely in its natural state, but still the three original types of landscape that constituted the region could well be distinguished. The sand dunes and hills were covered by a dense chapparal of live oak *(Quercus agrifolia)*, *Ceanothus thyrsiflora*, and on northern well-moistened declivities by buckeye trees *(Æsculus californica)*. In some localities a wild cherry *(Prunus ilicifolia)* entered this combination, but was in growth and foliage so little different from the other components that it easily escaped notice.

This whole region grew very little grass, a fern *(Pteris aquilina)* forming a kind of a rough and rather transparent turf. With the exception of a *Scirpus*, even on marshy places, no Cyperaceous plant was growing. *Achillea millefolium*, *Baccharis*, *Solidago*, *Scrophularia* and *Mimulus* distributed in tufts, varied the otherwise naked ground. The depressions of this formation frequently contained marshes with a shrubby vegetation of currant bushes *(Ribes malvaceum)* and gooseberries *(Ribes californicum)* and a herbaceous vegetation of *Helenium*, *Baccharis* and *Mimulus*.

This character of vegetation reached, almost without modification, up to the Mission Dolores, where grassy plains and hills, containing arborescent growths only in their ravines, took its place. A belt of the same formation extended from North Beach to the Presidio, interrupted here and there by the *Artemisia* and *Franseria*, vegetation of the moving dunes and the seashore.

The character of this open tract was in no way different from that of the common California pasturage ground when its vegetation is not yet too much interfered with. A turf, mostly of annual grasses, whose monotony relieved by frequent patches of *Nemophila* and *Eschscholtzia*, is interwoven with different species of *Panicula*, *Orthocarpus*, *Castilleja* and *Lupinus*, the latter in their arborescent species frequently forming miniature forests.

The third formation of landscape was the most characteristic, and many of the component parts of its flora have entirely disappeared from our neighborhoods; one of them, an *Arenaria* of singular beauty, probably is extinct, at least has not yet been found again in any other locality.

This formation occupied the southern part of the peninsula, and consisted of a large marshy plain, merging, towards the sea, into the common California marsh, full of meandering, brackish creeks, and separated on the other side from the *Ceanothus* and live oak and chapparal, by a densely interwoven and much varied arborescent vegetation, where the trees of the chapparal mingled with *Myrica*, dogwood *(Cornus)*, honeysuckle *(Lonicera)*, *Garrya*, bay tree *(Oreodaphne)*, *Photinia*, etc. A corresponding herbaceous vegetation of luxuriant *Megarrhiza*, hemlock, *Heracleum*, different species of *Rumex*, *Polygonum*, and three gigantic species of *Aspidium* covered the black and yielding ground.

After having penetrated this belt, you would enter a boggy prairie, in which stripes of the above-mentioned arborescent vegetation indicated the more elevated points and ridges. The vegetation of the prairie itself was a most anomalous one, considering the latitude and the merely nominal elevation above the level of the sea. It was a speck of the Arctic flora. Out of a mossy surface rose the slender culmi of a *Festuca* mixed with *Carex* and *Eriophorum*. The characteristic *Menyanthes trifoliata* showed everywhere its feathery racemes; at present, when you wish to see them, you have to go to Alaska, or to very considerable mountain elevations. Besides these was growing a *Habenaria* and the *Epipactis gigantea*, two orchideous plants. *Angelica*, *Heracleum*, *Œnanthe*, *Hydrocotyle* and *Nuphar* represented a vegetation which can be studied still in some localities of this peninsula, but not in the vicinity of the city. Wherever the moisture formed a surface, it was immediately covered by the graceful *Azolla caroliniana*, a *Bidens* and the *Arenaria* above mentioned that has not yet been found again. Now the first-mentioned type of vegetation, the chapparal, exists still in some fragments in the Presidio reservation; the second, that of the pasture land, is to be met with still, wherever the distance from the city is considerable enough to protect native vegetation; but the third type has entirely disappeared.

We now come to the causes. It is not only the quick growth of the city, the sudden change of grade, etc., that have disturbed the original equilibrium in nature, for there still exist lonely, neglected places enough in the immense circumference of the city, where an original vegetation could have remained undisturbed, and where it was protected even against the attacks of domestic animals.

By comparing the present flora of the surroundings, we shall easily recognize one of the most powerful agents in the destruction of original vegetation. At present the three original types of landscape are no more distinguishable. The improvements of a growing city have brought all to the same level. The original arborescents have been cut down partly for fuel, partly to make room for houses. Horticulture has replaced them by the conifers of our Sierra and the evergreens of Australia.

The vegetation of the peninsula is at present more Australian than Californian, and if it was not for the beauty of our sequoias, pines and firs of our mountains, scarcely any California tree would have found admission.

Parallel with this artificial immigration of Australian arborescents, goes an herbaceous immigration from Europe and Africa. Our original vegetation has very little power of resistance. Its very variation is a proof of a certain want of vitality, for any more vigorous organization, by superseding the weaker ones, would have produced originally the monotony developed at present by the immigration of foreign plants.

First of all I mention *Silybum marianum*, a native of the Mediterranean region, observed by me the first time in 1854 in California, in 1848 in South Australia. Wherever it gets a hold of the soil all native vegetation disappears. California is not the only land invested by this thistle. I have witnessed the same invasion in South Australia, and have read the statement of my former teacher, Prof. Burmeister, at present in Buenos Ayres, that the same thistle protects, through the time of its vegetation, the settlers against inroads of the Pampas Indians, as even these wild horsemen cannot cross the immense thickets formed by the same species of thistle. The influence of this weed is not confined to the neighborhood of San Francisco, and it is chiefly the miniature forests of lupines that suffer from its invasion.

Another weed, *Cotula coronopifolia*, does the same work in moist ground that is begun by Silybum in the more arid tracts of soil. The plant, a native of Southern Africa, was observed for the first time by me in 1854. I also have witnessed its invasion of South Australia, and I recollect very well the single specimen I found near Adelaide in 1845. It is well known in Mediterranean Europe, but as to the date of its invasion, I only know that it was common there at the same time when I found the first specimen in Australia. This weed has transformed the varied aquatic vegetation of the different places invested by itself into one monotonous green mass with yellow buttons. Our graceful water fern, *Azolla*, that formerly ornamented abundantly our creeks by its floating turf, is scarcely to be found any more.

Now, both of these plants which could be called "the coming plants," are Syngenesists or Compositæ. The Compositæ themselves are characteristic of the most modern flora, for in a fossilized state they are only found in the most modern formations; in fact, the only fossilized Compositæ of which I know, were products of a river that fossilized everything thrown into it. Now it appears that in the fight for existence the junior sons of creation have a decided advantage, and this accounts for the otherwise inexplicable circumstance that the variety of organisms decreases so perceptibly when we enter the realms of *Gymnosperms*, vascular *Cryptogams*, and all those forms of organic life that existed in the early periods of the earth.

Botanical Notes.—In the *Bulletin* of the Torrey Botanical Club, which, by the way, now appears regularly each month, and with a neat cover, Mr. G. E. Davenport describes and figures in an excellent plate, a new fern (*Notholæna grayi*) from Southeastern Arizona.——*Grevillea* for June contains a thoughtful essay on Peziza, by M. C. Cooke.——The *Journal of Botany* for May and June continues to review the British Characeæ, and the botany of the British Polar Expedition for 1875–1876.——Dr. Engler, of Kiel, has published the first part of an essay on the evolution of the vegetable kingdom since the Tertiary period, under the title, "Versuch einer Entwicklungsgeschichte der Pflanzenwelt." It relates to the extra-tropical regions of the Northern hemisphere.——Dr. H. Müller contributes to *Kosmos* an interesting critique of Gaston Bonnier's essay on the nectaries of flowers which was written in opposition to recent doctrines of the evolution of flowers.——Messrs. Sereno Watson and C. S. Sargent are botanizing in Northern California and Western Oregon this summer, while Mr. Vasey, a son of Dr. George Vasey, is studying the trees of Southern California for the Forestry Report of the tenth census. Mr. E. L. Greene is herborizing in Southern California, Arizona, and New Mexico. We have two interesting papers from him which have been crowded out unfortunately for want of space.

ZOÖLOGY.[1]

TARDIGRADES AND EGGS.—Having found several specimens of Tardigrades during the past month, I have been fortunate enough to confirm what has been observed in Europe in regard to their peculiar manner of depositing their eggs. Among them was one which contained within the body, as nearly as I could determine, six spherical masses, which, when examined with higher power, appeared to be collections of eggs. It was in the act of molting, the old skin having slipped back so far as to set free the three anterior pairs of limbs, while the posterior pair was plainly seen moving within. The skin was empty with the exception of a

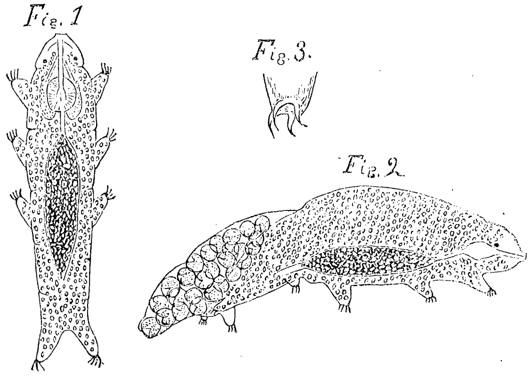
Fig. 1
Fig. 3.
Fig. 2.

FIG. 1—Normal individual seen from above. FIG. 2.—Individual with egg sack attached. The embryos can be seen within the eggs. FIG. 3.—Enlarged view of foot.

---

[1] The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.